DIFFUSION REPLICA DELAY CIRCUIT

ABSTRACT OF THE DISCLOSURE

1. In a device having a device capacitance and operational characteristics, a diffusion replica delay circuit, comprising:
   a. a diffusion replica capacitor, coupled to the device, and capable of storing a predetermined replica charge representative of a selected device operational characteristic, and
   b. a diffusion replica transistor, coupled with the diffusion replica capacitor, coupled between the diffusion replica capacitor and a charge sink, the transistor being disposed to control the magnitude of the predetermined replica charge.

2. The diffusion replica delay circuit of Claim 1, wherein the device is a memory device having a dummy cell with a dummy bit line and a plurality of wordlines, the diffusion replica capacitor being coupled to the split dummy bit line and a limited number of wordlines.

3. The diffusion replica delay circuit of Claim 2, wherein the diffusion replica capacitor is coupled to one wordline.

4. The diffusion replica delay circuit of Claim 1, wherein the device includes a plurality of access transistors having an access chain characteristic, and the diffusion replica transistor is disposed to be representative of the access chain characteristic.

5. The diffusion replica delay circuit of Claim 2, wherein the device includes a plurality of access transistors having an

access chain characteristic, and the diffusion replica transistor is disposed to be representative of the access chain characteristic.

6. The diffusion replica delay circuit of Claim 3, wherein the selected device operational characteristic is a dummy bitline capacitance of a bitline coupled to the diffusion replica delay circuit, and the diffusion replica capacitance is substantially matched to the dummy bitline capacitance.

7. The diffusion replica delay circuit of Claim 6, wherein the diffusion replica capacitance is substantially a predetermined fraction of the dummy bitline capacitance.

8. The diffusion replica delay circuit of Claim 6, wherein the dummy cell is coupled with a memory cell having local bitlines and local wordlines, and the diffusion replica delay circuit provides a limited voltage swing signal to at least one of the local bitlines and the local wordlines.

9. The diffusion replica delay circuit of Claim 6, comprising dummy cells operably coupled with a selected wordline decoder and a selected sense amplifier.

10. The diffusion replica delay circuit of Claim 9, wherein dummy cells are selectively coupled with memory cells, each having local bitlines and local wordlines, and the diffusion replica delay circuit provides a limited voltage swing signal to at least one of the local bitlines and the local wordlines.

11. The diffusion replica delay circuit of Claim 10, wherein the dummy cells comprise split dummy bit lines.

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A diffusion replica delay circuit substantially replicates a delay characteristic of a predetermined memory structure component, so that a localized timing signal can be generated. One embodiment of this aspect of the invention includes a diffusion replica capacitor, capable of a predetermined replica charge representative of, and generally matched to, a selected memory component operational characteristic. Where the memory component includes multiple access transistors with an access chain characteristic, the diffusion replica transistor is disposed to be representative of the access chain characteristic. Some diffusion replica circuits include a dummy cell with a dummy bit line with the diffusion replica capacitor coupled to the dummy bit line and one wordline. The diffusion replica delay circuit provides a limited voltage swing signal the local bitlines, the local wordlines, or both. Also, a split dummy bitline can be associated with a particular wordline, obviating the excess delay from grouped wordline association.

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